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•presenting at least three key words that are more likely to be repeated and differentiated in the research.

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•There must be a clear definition of the limits of the research and its population that the researcher is working on in his research.

•The researcher must consider choosing the correct methodology that is appropriate to the subject of his research, and must also consider the data collection tools that are appropriate for his research and the approach followed in it.

- Consideration should be given to the design of the research, its final output, and the logical sequence of its ideas and paragraphs.

•The researcher should take into consideration the choice of references or sources of information on which the research depends, and choose what is appropriate for his research taking into account the modernity in it, and the accuracy in documenting , quoting form these sources.

•The researcher should consider taking note of the results that the researcher reached, and make sure of their topics and their rate of correlation with research questions or hypotheses that the researcher has put in his research.

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Editor-in-chief

CONTENTS

Hedging devices in Medical Research Articles Written by Native and Non-native (Iraqi) Authors

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Roia N. Hammad *
Fatama Ismael Saleh *

تأريخ التقديم: ٢٠١٩/١٠/٢٤ تأريخ القبول: ٢٠١٩/١١/٢٦

Abstract

Scientific authors might probably be explicit, exact and precise in their writings to avoid openness to criticism and to seek acceptance by the equivalent community. They endeavor cautiousness, accuracy, and modesty in presenting their claims. The current study demonstrates the differences in using hedging devices in medical research articles written by native authors and non-native (Iraqi) writers. Varttala's (2001) taxonomy of hedging has been adapted to identify the types and forms of hedging in the Introductory section of 40 selected medical research articles written by native and non-native (Iraqi) writers, followed by Chi-square test and Critical Chi-square value to find if there are significant differences between the two groups of authors. Findings have revealed significant differences in using hedging devices between native medical authors and non-native (Iraqi) writers. However, both authors tend to use "Modal auxiliaries" hedging devices more than other hedging devices in writing. The study recommends more national studies to help novice Iraqi medical authors specifically medicine students to use hedging accurately in their writing, and to be aware that using such devices can improve the quality of writing in order to allow their publication be acknowledged nationally and internationally.

Lect / University of Technology- English Language Center.

Asst.Lect/ University of Technology- English Language Center.

University of Technology- English Language Center.

Key words : Hedging devices, Medical Research Articles, Varttala's Hedging Taxonomy, native and non-native writers.

1. Introduction:

Scientific writing has been associated with exactness and accuracy. The role of scientific author is to convey information in explicit and accurate manner. Scientific writing can be viewed from different perspectives; it is a universal and a culture – specific type of discourse (Martin, 2006, p.200), and a comprehensible discourse with specific strategies and usage of language, besides its main function as a communication tool. However, a scientific writer has many motives not to be exact and explicit in presenting claims rather than reduce the strength of utterances. Authors may consider unanticipated consequences of understanding, as being adequate, and precise in their scientific claims, or they may intend to express uncertainty about specific issues, or states of knowledge to enrich the readers' ability of considerable questioning, and critical thinking before the claims are clearly answered (Behnam, 2012, p.27).

Medical discourse is a kind of scientific discourse, which notifies scientific activities of researchers, academics and professionals. Most of the studies in written medical discourse are focusing on specific lexical and grammatical features and their functions and forms into the discourse. These activities are influenced by modes reasoning, methodologies objectives, etc. In other words, in scientific writings the choice of theories and methods depends on how to use a particular model in a particular moment and a specific reason in a particular discipline (Murawska, 2010).

Medical discourse research has recently developed to cover wide variety of areas such as the relationship and communication between participants of different professional and linguistic status. Mostly such researches are motivated by the quality of health care provided when there is cultural and linguistic disagreement between participants (Njweipi, 2012).

The language of medicine has been of great interest to researchers from various scientific disciplines; such as medical sociology, semiotic, discourse analysis and genre analysis. Each discipline has investigated the medical language from different

angles and perspectives. Different valuable insights are presented to offer effective communication and understanding between medical professional and readers (Helan, 2012).

Medical research article is the highest standard genre of medicine. Swales (1990) has indicated that "RA is a genre which has a standard rhetorical pattern: Introduction-Method-Results-Discussion (IMRD)". The present study discusses hedging devices in the Introduction section of medical research articles. In this section, the author tends mainly to find a "niche" by giving an overview to previous researchers' studies, identifies previous frameworks, and express his/her viewpoint which mainly needs to express cautiously by using hedging. (Šeškauskien, 2008, p.73)

1.1The concept of "Hedging":

The term hedge refers to certain expressions, which are used to maintain certain alliance, and to express fuzziness and vagueness. For linguistics, the area of hedging has been described as "a huge meadow of research" (Crystal, 1975). Lakof used the linguistic term "hedge"at the early 1970's when he published his article "Hedges". Lakof studied how certain words and phrases like (sort of, rather, very, largely,..etc.) have the ability "to make things fuzzier or less fuzzy" (Lakoff, 1973). Hedging has been used in language to mitigate or reduce the strength of claim that speaker or writer makes. (Martin, 2008)

Many researchers have investigated the importance of using hedges devices in writing in various disciplines. Hyland, is one of the prominent figures in discourse analysis, he carried out many studies that discuss hedging phenomenon in academic and scientific discourse. Hyland (1996) discussed the importance of using hedging devices in scientific writing and proposed strategies to help L2 learners to use hedging accurately in their writing, and recognize hedges devices correctly in experts' writings.

Hedging is a basic characteristic in writing that enables authors to show doubt and lack of certainty to show their confidence in their claims. It is used to show the writer's lack of certainty in the truth of value in the proposition. In using hedging devices, a certain room is left by the writer to allow readers judge the truth of value in the proposition (Rounds, 1981).

In speech act theory, to hedge is to reduce "face threatening ", it is used as interpersonal negative politeness phenomenon (Brown and Levinson, 1987). This is also true in academic knowledge where Myer (1989) pointed out that hedging includes both "positive and negative politeness". Academic knowledge claims are sometimes "Face Threatening Act", that's why it is important for academic authors to use certain hedging devices to avoid this act (Salager-Myer, 1994). However, hedging is not always a problem or an umbrella, rather being essential in expressing uncertainty in the same time, the writer needs to be accurate and clear. In this orientation, hedging is seen as a very important device in serving the textual function of language.

The study of hedges in research articles shows how scholars achieve and create knowledge in their works. According to Hyland (1996), knowledge is approved through social process and research is governed by sharing others agreement rather than searching for the truth of value. The scientific authors aim to persuade their readers in their claims of the truth of values .The scientific authors use expressions of uncertainty and doubt in terms of hedging in order to invite their readers to engage, join, and consider the truth of value in their writings (Reza, 2004).

Accordingly, it can be concluded that studying hedging received a substantial interest among scholars in different disciplines. However, according to the researchers' knowledge studying the forms and functions of hedging as to Iraqi medical authors has not given that much concern. Thus, this study might be of valuable contribution to the field of research specifically to academic writing.

1.2 Hedging Classifications:

Although researchers have categorized hedging in different ways, according to its forms and functions, they all agree that the taxonomy of hedging is rather arbitrary, since the criteria of its classification are not united (Yu, 2009). The following is a brief review of some important classifications of hedging in the literature :(Yuryevna, 2012)

1-Prince, Fraser and Bosk's Model (1982): Hedging is classified into two kinds:

- Approximators express fuzziness within the content; affect the truth of values. e.g. "*His feet were sort of blue"*
- Shields express the fuzziness in the relationship between the author and his/her study content .i.e. to what degree he/she commits to the truth of values in the content . e.g." *I think his feet were blue*"

2-Salager _ Meyer's Model (1994):Hedging taxonomy is a combination of syntactic and functional criteria. She proposed five types of hedging "Shields, Approximators, Personal Expressions, Emotionally Charged Intensifiers, and Compound hedges". (Fig. 1)

Fig. (1) Salager-Meyer classification

3-Hyland's "polypragmatic" Model (1998): Hyland developed a "fuzzy category". The model located more than one clear and overlapping interpretation of hedges .In his opinion, hedges can be defined as " the means by which authors can present a proposition as an opinion rather than a fact: items are only hedges in their epistemic sense, and only when they mark uncertainty" (p.5).

4- Vartalla (2001): Revised Hyland (1998) model of hedging. Varttala's categorization (2001) includes all possible lexical hedges. According to Varttala (2001) there are numerous ways in which hedging may be realized in English like certain modal auxiliaries, some lexical elements with related meanings as well as non-lexical hedging devices, namely clausal elements, questions, and others. Figure 2 below shows the classification of hedging forms according to Varttala (2001)

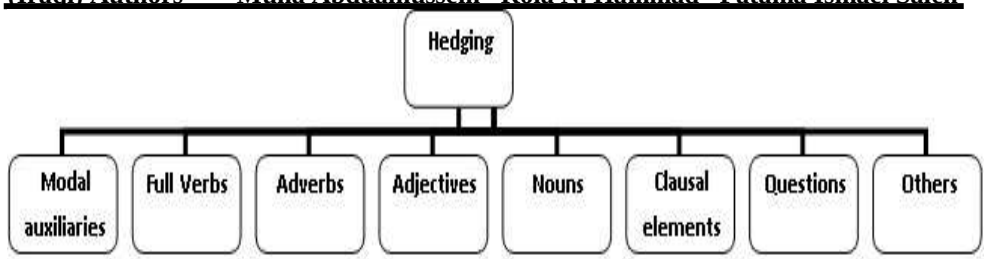

Figure 2. Classification of hedging forms (Varttala, 2001, p. 289)

5-Yu's Model of Hedging (2009): Yu's model is based on the semantic, grammatical, and pragmatic aspects of hedging devices .The sources of hedging are considered from the interaction between the semantic, grammatical, and pragmatic devices of hedges. He distinguished four categories of hedging:

- "Modal hedges": Include modal auxiliary verbs, modal adjectives, modal adverbs, and modal nouns.
- "Performative (mental) Hedges": Include lexical verbs with epistemic meaning.
- "Quantificational Hedges": Include the devices, which indicate quantity.
- "Pragmatic–marker (implicit) Hedges": This kind of hedge is a characteristic of spoken discourse rather than written discourse. (Yu, 2009).

Yu's model suggested that hedging devices are included within three strategies:"approximators, shields, and implicit hedges".

2-Purpose of the Study:

The study is a contrastive study. It aims to investigate the forms and functions of hedging in the Introduction section of medical research articles written by native and non-native (Iraqi) medical writers, then to identify the differences in the usage of hedging devices by the two groups in the Introduction section of medical research articles. In order to achieve the purpose of the study, 40 articles in two medical journals were selected. The native articles were selected from the "British Journal of Medicine and Medical Research" and the non-native (Iraqi) articles were selected from the "Iraqi Journal of Medical Science". By achieving the purpose of the study, which has a constructive nature, it will be

clear how NS and NNS differ in using hedging devices to present their claims.

3. Procedure and data analysis

To achieve the purpose of this study, forty articles from the "Iraqi Journal of Medical Science" and the "British Journal of Medicine and Medical Research" were selected. The generally adopted structure of these medical articles is Swales' IMRD (introduction, methods, results and discussion) that has been defined in his CARS model (creates a research space). (Swales, 1990) According to this structure, the Introduction is the part which gives the rationale of the study. It starts with giving a background of the problem, then identifies a niche and raises the research question(s) needed to be solved.

According to Hyland (1995), the Introduction section is more hedged than Methodology and Result sections. However, it is less hedged than the Discussion section, since Discussion needs comments and judgments of the author (Hyland 1995,pp37-38). Although, in finding a niche in the Introduction section the author should clearly evaluates other sources and expresses his/ her point of view, thus he/she must be very cautious to express others ideas by employing hedging devices.

The procedure of analysis in this study adopts both quantitative and qualitative methods so as to identify the differences in using hedges by NS and NNS and the reasons behind such differences. The Introduction sections of 40 medical articles written by two groups of authors have been analyzed manually to examine forms and functions of hedging devices. The number of words comprises 6680 words (2800 words written by NS and 3880 written by NNS writers). The analytical framework used in the current study adapted from Varttala's model (2001). This framework has been used by many researchers such as; Atai&Sadar (2008), Tahririan&Shahzamani (2009), Rita Laurinityte (2011) with some modification…., and others.

4. Results and Discussion

In this study hedging linguistic devices in forty Introductions of medical articles written by two groups of authors(NNS &NS) have

been identified and distributed according to their linguistic function as shown in Table(1). Also, Chi-square calculator is used to find if there are significant differences in adopting hedging devices between the two groups of authors in writing the Introductions of medical authors as shown in Table2.

Table (1) summarizes the overall distribution of hedging types scrutinized in the corpus and their frequency according to the categories of hedging mentioned in the analytical framework.

Table (1) Hedging distribution and frequency in the corpus adapted from (Varttala, 2001, p.289) typology.

Hedging main categories	NNS Introductions		NS Introductions	
	Frequency	%	Frequency	%
1. Modal auxiliaries	298	41%	110	26%
2. Adverbs	93	13%	80	19**%**
3. Nouns	48	7%	45	11**%**
4. Adjectives	131	18%	75	18%
5. Full verbs	103	14%	90	21**%**
6. If clause	51	7%	20	5%
Total	721		420	

As it is shown in Table1, 'Modal auxiliaries" are the most frequent hedge devices used by both groups of authors (41% and 26%) respectively. However, it can be noticed from Table 1 that NNS authors have made more frequent use of 'Modal auxiliaries' and " If clause" (7%) of hedging devices than 'Adverbs', and "Adjectives" of hedging devices. On the other hand, NS authors have made incidents of hedging as "Adverbs", "Nouns", and" Full verbs" more frequent than NNS do. It is obvious from Table1 that NNS and NS authors have the same frequent usage of Adjectives as hedging devices. The less used of hedging devices for NNS and NS authors are found to be in "If clause" (7% and 5%) respectively. These results can be supported by using Chi – square as shown in Table2 below:

Table 2: Chi-square for the frequency of hedging devices in the Introductions of medical authors

Hedging devices	1	2	3	4	5	6
NNS	298 41%	93 13%	48 7%	131 18%	103 14%	51 7%
NS	110 26%	80 19%	45 11%	75 18%	90 21%	20 5%
Chi-square= 39.30			D.F.= 5			

Table 2 shows that since Chi-square value = 39.30 at 5 degrees of freedom is higher than the critical Chi-square value = 9.23. It can be concluded that there are significant differences between the two groups of authors in using hedging devices in writing the Introduction of the medical articles.

As shown previously, data analysis of the Introduction section in forty medical articles written by two groups of authors revealed significant differences in their choices of hedging devices. In the selected data “Modal auxiliaries" are frequently used by both authors. The most frequent "Modal auxiliaries" that expressed hedging in the Introductions of the chosen medical articles are; *may, might, should, would,* and *could*. Notice the example below taken from the Introduction of NS medical article:

"Some details of Mona Lisa's face remain mysterious until today. The scar under the lower lip may be the result of injury with a blunt object. Her eyebrows appear depilated, but loss of the eyebrows and lashes might be a result of fading and overcleaning of the artwork during the centuries since its production" NS

Hyland (1998) states that “Modals auxiliaries" such as *may*, and *might* "considered as the prototypical hedging devices" (Hardjanto, 2016, p.42). In the statement above, the writer expresses his/ her idea indirectly by using modals of possibility *may* and *might* as hedging devices.

"Full verbs"(e.g. suggest, argue, propose, appear, seem …). assign the degree of the writer's confidence to his/ her assertion, they act "to generalize and emphasize the speculative nature of statements" (Hyland, p.249). Notice the following example taken from an introduction of NNS medical article::

"Patients with genotypes 1 and 4 generally exhibit a poorer response to IFNbased therapy than those with genotypes 2 and 3. HCV genotype 5 appears to be an easily treaTablevirus, with response rates compatible with those of genotypes 2 and 3 therapy". (NNS)

One of the common devices used to express hedging is "if clause". Medical authors in writing the Introduction of the medical articles tend to use " if clause" to express the quality of their commitment to others points of view as shown in the statement below taken from NNS medical article:

"Tissue biostimulationis only possible if irradiated cells possess molecular photoacceptors or photosensitive capacity that absorb the light and enter into state of excitation, that trigger intracellular cascade of signals leading to measurable biological effect" NNS

Incidents of hedging such as Nouns, Adjectives, and Adverbs represent a strategy used by the writers to describe a straightforward scientific knowledge claims without being too assertive as they provide information to their readers. (Vartalla, p.258). Notice the following examples

"Diabetic patients are usually older, overweight, less likely to exercise, and more likely to have comorbidities and complications".(NS*)*

Autoclaving is currently one of the current method of sterilization and usually handled by technicians who are academically, technically and professionally qualified. (NS)

There is often a need to test patients without such lesions. Physicians may need to establish a serologic diagnosis or detect nucleic acid (NNS.)

Infection is relatively common, with seroprevalence approaching 80% for HSV-1 and 20% for HSV-2 in adult populations(NNS).

It is found that incidents of hedging regarding Nouns, Adjectives, and Adverbs exist in the selected data included; Adverbs and Adjectives that express frequency (*often, sometimes, usually, always, never, common),* probability (*likely, probably, possible),* or degree

(*relatively, significantly, slight*). These devices normally adopted by the author to show the degree of commitment to the proposition, i.e to denote indefinites and uncertainty toward the content being introduced.

To sum up and according to aforementioned discussion of the results, there are differences in using hedge devices by both NS and NNS writers, however, there is no much variation in such usage, and this proves that there is almost a similar tendency of using those devices in medical writing.

5. Conclusion

Hedging in medical writing involves the writers' tendency to persuade the readers of their medical knowledge claims. To do so, authors need to present these claims cautiously rather than being overconfidence by means of hedging. The present study attempts to explore hedging forms, frequencies, and functions adopted by medical authors as they write the Introduction of the medical research articles. Forty medical research articles have been chosen from two medical journals. Half of them were chosen from the " *British Journal of Medicine & Medical Research"* for NS authors and half were chosen from" *Iraqi Journal of Medicine Sciences"* for NNS writers. It is fair to say that findings did not show much variation in adopting hedging devices; however the differences which have been found were in the frequency of these devices as explained in the results. Chi-square test proved that there are significant differences in adopting hedging devices between the two groups of authors. It is important to maintain that hedging can help professional authors not to be overstated regarding their claims. In this study hedging devices only explored in expert authors, however for many researchers hedging is very important in teaching novices even explicitly in the texts " can be a great help for them in reading, translating, or writing" (Alibabaee & Shahzamani, 2013,p.9). Additionally, hedging is not only used in writing for medicine. Consequently, it is very important to study and/ or compare hedging devices in different disciplines. Such kind of research can help to improve the quality of writing in different fields of knowledge.

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Appendix

Review of Related Studies

Study	Focus	Purpose of Study	Basic Findings
Behnam, Biook, 2012	Using Hedges by Scientific writers	Investigating the frequency, form andfunction of hedging in the discussion sections of qualitativeand quantitative research articles.	There is statistically significant difference between qualitative and quantitative research articles in scientific writing.
Holtz, Monica,2011	Scientific Writing	Properties of research articles.	Language of science is the range of forms in which scientific activities are performed.
Murawska, Magdalina,2010	Medical discourse	Studies in Written Medical Discourse	The choice of Theories and Methods depends on the discipline.
Njweipi ,Benyue 2012	Medical discourse recent investigations	The studies main focusing.	Cultural health and the degree of agreement and disagreement in society
Holtz, Monica,2011	Language of Medicine	Medical language interests and perspectives.	Different valuable insights were presented to achieve engagement between authorsand readers.
Sukhanindr , Maneerat, 2008 Reza,2004	Medical research Article	Swales Medical Research Article as Genre and discussion section description.	Medical research article has a standard rhetorical patterns
Martin-Martin ,Bedro , 2008	Hedging	Hedging background	Hedging is an important device in writing.
Lakoff, G.1973 Hyland ,1995 Round,1981	Hedging in writing	Hedging definitions	Hedging references in writing.
Salager-Myer, 1994	Hedging Taxonomy Hedging in speech act theory	The types of hedging in writing and hedging as negative and positive politeness	Hedging is very in speaking is used to reduce “Face Threatening “.The same is in writing.

Yuryevna,2012	Hedging classifications	The stages of hedging development in history.	Hedging notion is developed through 3 stages in literature.
Sadar ,	Discussion section in research article.	Hedging in the discussion section.	Hedging is much higher in the discussion section.

أَجهزة التحوُّط في مقالات البحوث الطبيَّة التي كتبها مؤلِّفون أَصليون وغير مواطنين (عراقيين)

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رؤى ناهض حماد*

فاطمة إسماعيل صالح*

المستخلص

ربما يكون المؤلفون العلميون صريحين ودقيقين في كتاباتهم لتجنُّب الانفتاح على النقد والسعي لقبول المجتمع المكافئ، ويجتهدون في الحذر والدقة والتواضع في عرض ادعاءاتهم، وتوضِّح الدراسة الحالية الفروق في استخدام أَدوات التحوط في المقالات البحثية الطبية التي كتبها مؤلِّفون أَصليون وكتَّاب غير أَصليين (عراقيين)، وتمَّ تكييف تصنيف (Varttala 2001) للتحوُّط لتحديد أَنواع التحوط وأَشكالها في القسم التمهيدي لـ ٤٠ مقالة بحثية طبية مختارة كتبها كتاب محليين وغير أَصليين (عراقيين)، متبوعًا باختبار Chi-Square و Critical Chi- القيمة التربيعية لمعرفة ما إذا كانت هناك فروق ذات دلالة إحصائية بين مجموعتي المؤلفين، وكشفت النتائج عن فروق ذات دلالة إحصائية في استخدام وسائل التحوُّط بين المؤلفين الطبيين المحليين والكتاب غير الأصليين (العراقيين)، ومع ذلك، ويميل كلا المؤلفين إلى استعمال أجهزة التحوط "المساعدة المشروطة" أكثر من أجهزة التحوط الأخرى في الكتابة. توصي الدراسة بإجراء المزيد من الدراسات الوطنية لمساعدة المؤلفين الطبيين العراقيين المبتدئين على وجه التحديد طلاب الطب على استخدام التحوط بدقة في كتاباتهم ، وإدراك أن استخدام مثل هذه الأجهزة يمكن أن يحسن جودة الكتابة للسماح بنشرها على المستوى الوطني والدولي.

الكلمات المفتاحية: أجهزة التحوط، مقالات البحث الطبي، التحوط الخاص بفارتالا، التصنيف ، الكتاب الأصليون وغير الأصليين.

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